energy efficiency for victoria

action plan

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A Victorian Government Initiative

Victoria
The Place To Be

foreword

Energy efficiency is one of the most cost-effective ways by which Victorians can cut greenhouse gas emissions in the short term. It also makes good economic sense to use energy more efficiently – doing so can cut business, household and government energy costs.

Victoria's rainfall is close to the lowest since records began and Melbourne is in the middle of the driest winter in 148 years.

From the hardship of drought to the devastation of bushfires, Victorians are already experiencing the impacts of climate change.

The overwhelming consensus of scientists is that global warming, due to our increased use of fossil fuels, poses the greatest threat to the world community.

Reducing our energy use and being more efficient with Victoria's vast energy sources is the quickest and cheapest way of reducing our greenhouse emissions in the short term.

The production and use of energy (excluding transport fuels) is responsible for 67% of the greenhouse gases emitted annually in Victoria. If we are to make a difference and achieve the deep cuts in greenhouse gas emissions that scientists say will be needed over the coming decades, our energy sector cannot continue along a 'business as usual' path. We need to understand and accept that the future must be different.

John Thwaites MP
Minister for Environment

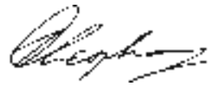
This will require a big effort on a range of fronts – including increased use of renewable energy; the development and deployment of new technologies that enable us to use our resources of brown coal with much lower levels of greenhouse gas emissions; and substantial improvements in energy efficiency.

In many cases, energy savings can be made by changing our behaviour or making smarter choices when buying a new appliance or upgrading work equipment. In other cases we may need to make an up-front investment to reap the savings in the medium term.

This Action Plan takes energy efficiency in Victoria to the next level. It builds on important achievements to date, including our Government's introduction of 5 star standards for all new homes and energy efficiency requirements for EPA licensees.

The Action Plan includes initiatives such as benchmarking our energy bills and giving rebates to help Victorians switch to 5 star appliances.

The policies and programs detailed in this Action Plan are an important step – but they are not the final word on energy efficiency. The Bracks Government will continue to work with business and the community to raise the bar on this issue so we protect our environment and economy for future generations.



Theo Theophanous MP
Minister for Energy Industries

This Action Plan takes energy efficiency in Victoria to the next level. It builds on important achievements to date, including our Government's introduction of 5 star standards for all new homes and energy efficiency requirements for EPA licensees.

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introduction

This Action Plan sets out a comprehensive program of Government action to drive improvements in energy efficiency and greenhouse gas abatement. It also clearly establishes the context for action – detailing where Victoria stands today and the opportunities and challenges with respect to energy efficiency - and outlines the Government's broad objectives and strategies.

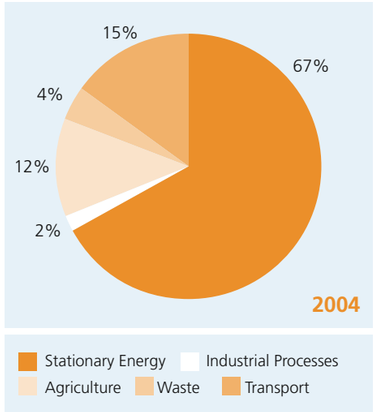
The Victorian Government recognises that climate change is the most serious environmental problem facing the global community. Its impacts will be far-reaching and the steps needed to prepare our economy for a carbon constrained future require all of us – government, business and individuals – to make changes.

The scientific consensus is that deep cuts in greenhouse gas emissions are needed by the middle of this century if we are to avoid dangerous levels of climate change. This is a major challenge for Victoria and other communities globally. In particular, it will mean changing the way we produce and use energy.

The use of energy underpins activity across all sectors of the economy and is a major feature of our way of life. It is also responsible for a major share of Victoria's greenhouse gas emissions. Non-transport energy use – ie. the stationary energy sector[1] – was responsible for 67% of Victoria's greenhouse gas emissions in 2004[2], mainly arising from electricity and gas used in industry, businesses and homes. Energy-related emissions are a significant issue because they have been growing steadily over the past decade and a half, largely as a result of growing demand for energy. Emissions from the stationary energy sector increased by 32.4% between 1990 and 2004.[3]

Achieving reductions in greenhouse gas emissions needs to involve both those who supply energy and those who use it. These reductions can be made by changing the mix of fuel used in the generation of electricity; through greater use of renewable energy; by developing and deploying new electricity generating technologies (eg. 'clean coal' technologies); by fuel switching from electricity to gas where practicable; and by more efficient use of energy by key sectors – business, residential and the public sector.

Significant improvements in energy efficiency are possible across all sectors of the economy to deliver immediate, cost-effective greenhouse gas abatement and prepare us for a carbon constrained future. This Action Plan demonstrates the Government's commitment to a sustained and strengthened program of action on energy efficiency, focused on non-transport energy use in the residential, commercial, industrial and government sectors.



> Figure 1 - Victoria's greenhouse gas emissions by sector, 2004 (*DSE, 2005*)

1. Stationary energy refers to all energy used for non-transport applications. This includes the energy used in homes, businesses and industry – such as electricity, as well as heat from combustible fuels such as biomass (eg. wood), oil, coal and gas.
2. Victoria Greenhouse Gas Inventory – 2004 Information Sheet – noting that 2004 is the latest year for which greenhouse gas inventory figures are available for Victoria.
3. Victoria Greenhouse Gas Inventory – 2004 Information Sheet at www.greenhouse.vic.gov.au.

Through the *Greenhouse Challenge for Energy* position paper (December 2004), the Government signalled the importance of an integrated and long term strategic approach to energy and greenhouse issues.

Greenhouse Challenge for Energy

The *Greenhouse Challenge for Energy* position paper (2004) sets out the Government's energy-related greenhouse policy objectives as follows:

- Reduce greenhouse gas emission from the production and use of energy;
- Identify and pursue policy paths which:
  - facilitate Victoria's transition to a carbon-constrained future;
  - protect Victoria's economic interests by maintaining a secure, reliable and affordable supply of energy;
  - create an attractive environment for investment in the energy sector and wider economy; and
  - ensure the Latrobe Valley's long term future.

The position paper set out the Government's view that these broad objectives can best be met through an integrated package of measures including a national emissions trading scheme; policies and measures to increase use of renewable energy and to improve energy efficiency; and support for the development, commercialisation and deployment of low emission energy technologies.

http://www.greenhouse.vic.gov.au/images/2168_Greenhouse_Challenge_Position_Paper.pdf

Our Environment, Our Future (2006) carries forward this work with a range of climate change and energy policies and programs to be pursued over the next three years and beyond. It sets out a program of action both with respect to energy supply (through reductions in the greenhouse gas intensity of our electricity and broader energy systems); and reductions in energy demand growth, particularly through improvements in energy efficiency. *Our Environment, Our Future* also details key policies and programs aimed at reducing transport-related greenhouse gas emissions.

Energy efficiency is an important area for further action to tackle climate change – building on the range of energy efficiency policies and programs that already have a well established presence in Victoria and have demonstrated environmental, economic and social benefits to date.

International Energy Agency on energy efficiency –

Improving energy efficiency both by reducing quantities of energy consumed and by changing processes, offers a powerful tool for achieving sustainable development by reducing the need for investment in energy infrastructure, by cutting fuel costs, by increasing competitiveness for businesses and welfare for consumers. It can create environmental benefits through reduced emissions of greenhouse gases and local air pollutants. It can offer social benefits in the form of enhanced energy security (through reduced reliance on fossil fuels, particularly when imported) and enhanced energy services.[4]

background

Trends in energy consumption and energy efficiency to date

Energy consumption in Victoria (not including energy used for transport) increased by 20% over the period 1990 to 2004[5], and in turn is driving increases in our greenhouse gas emissions. In the absence of the adoption of additional energy efficiency measures, it is expected that electricity consumption will increase by 1.4% pa. over the period 2006-2015.[6]

Significant reductions in our energy-related greenhouse gas emissions can be achieved by:

- reducing growth in demand for energy services[7] – eg. maximising the use of natural lighting in buildings and increased use of natural ventilation rather than air conditioning;
- reducing the amount of energy required to deliver a given energy service (energy intensity) – eg. using more energy efficient compact fluorescent lights rather than incandescent lights and using more energy efficient air conditioners;
- reducing the greenhouse gas intensity of our energy use – through changes to the energy supply system including greater use of renewables and low emissions energy; and
- switching the end use energy consumption of appliances to less greenhouse gas intensive sources – eg. solar and gas for water heating.

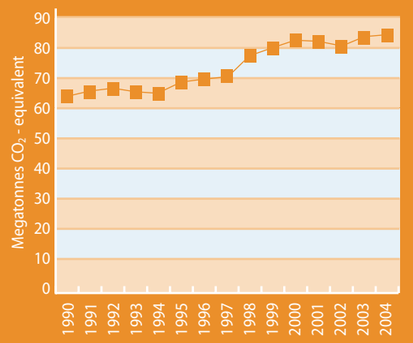
The focus of this Action Plan is on these first two areas, recognising that energy efficiency has an important role to play in both reducing energy demand growth and reducing the energy intensity of various processes and activities. Other Government policies and programs are directed at addressing the greenhouse gas intensity of the energy supply system.[8]

Victoria, in common with much of the developed world, is experiencing growing demand for energy services. This is a result of population growth and rising incomes which in turn drive the construction of larger houses, higher comfort levels (more heating and cooling) and increased use of electrical appliances and equipment in households and offices.

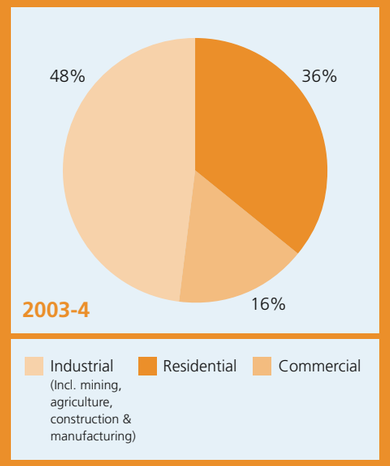
The commercial/service sector has been the strongest area of growth in energy-related greenhouse emissions – between 1990 and 2004 there was a 72.3% increase in energy-related emissions from the commercial sector.[9] This reflects both the growth of activity in this area and its high levels of electricity use. The residential sector experienced a 32.6% increase, making this the second fastest area of growth.[9] Population growth, income growth and lifestyle changes will continue to be significant drivers of energy demand in the future.

Energy demand trends underline the importance of taking action to achieve efficiency improvements and avoid unnecessary energy use – to contain demand growth and contribute to absolute reductions in greenhouse gas emissions.

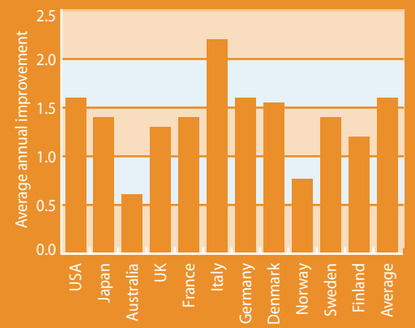
On the positive side, there is evidence that significant changes in our energy consumption can be achieved. International Energy Agency (IEA) analysis shows that energy intensity was reduced significantly in a range of OECD countries over the period 1973 to 1998. The IEA concluded that: "without 25 years of energy savings, energy consumption would have been almost 50% higher".[10] While Australia showed some improvement in its energy efficiency over this period (by around 0.6% per annum), it was at the lower end of the range for the 11 countries studied[11] (refer Figure 4).



> Figure 2 - Trends in Victoria's stationary energy sector emissions, 1990-2004 (*DSE, 2005*)



> Figure 3 - Stationary energy sector greenhouse gas emissions by end use sector, 2003-04 (*DSE, 2005*)



> Figure 4 – Improvement in energy efficiency for 11 OECD countries, 1973-1998 (*based on IEA, 2005*)

4. Refer IEA website http://www.iea.org/Textbase/subjectqueries/keyresult.asp?KEYWORD_ID=4122.
5. *Energy Working Party Conference*, National Institute for Economic and Industry Research, December 2005.
6. *Energy Working Party Conference*, National Institute for Economic and Industry Research, December 2005, p.5:38.
7. Energy services (or the services provided through the purchase of energy) include heating, cooling & lighting.
8. *Renewable Energy Action Plan* (July 2006) and Energy Technology and Innovation Strategy – http://www.business.vic.gov.au/BUSVIC/STANDARD/1001/PC_60888.html.
9. *Energy Working Party Conference*, National Institute for Economic and Industry Research, December 2005.
10. *Oil Crises and Climate Challenges: 30 years of Energy Use in IEA countries*. International Energy Agency, Paris 2004.
11. *The Experience with Energy Efficiency Policies and Programmes in IEA Countries – Learning from the Critics*, IEA Information Paper, International Energy Agency, August 2005.

Energy savings in these OECD countries to date have largely resulted from reductions in energy intensity through improved energy efficiency in appliances, space heating and industrial processes.[12] For example, it has been estimated that California's energy efficiency regulations from the mid–1970s to the end of the 1990s saved Californian businesses and consumers more than $50 billion in electricity and natural gas expenditures. Appliance standards and energy efficient building codes in California will, by 2011, provide an additional $57 billion in energy efficiency cost-savings.[13] In Victoria, existing and proposed mandatory energy labelling and minimum energy performance standards for appliances are estimated to deliver cumulative savings of 44.2 $MtCO_2$-e[14] and a net benefit (energy savings minus increased equipment costs) of $2,436M (at a 5% discount rate) over the period 2005 to 2020.[15]

In Victoria there is scope for major improvements in energy efficiency and savings in energy and greenhouse gas emissions. Analytical work undertaken in the development of the National Framework for Energy Efficiency[16] indicated, on a national basis, that energy consumption in the manufacturing, commercial and residential sectors could be reduced over a 12-year period, beyond business as usual levels, by:

- between 7% to 13% with the adoption of current commercially available technologies with paybacks of less than 4 years (with the average payback for all of these measures being around 2.2 years); and
- between 15% to 22% with the adoption of current commercially available technologies with an average payback of 4 years.

Victoria has already started to take up some of these opportunities in both the industrial and building sectors. However, these efforts need to be extended and matched in other sectors if we are to reduce energy demand growth and achieve significant reductions in our greenhouse gas emissions.

Scope for further action

There are significant opportunities available for further cost-effective energy efficiency improvements across the economy.[17] In many cases, energy efficiency improvements can be achieved simply by changing our behaviour or making well-informed choices when purchasing appliances or equipment. In other cases, relatively modest up-front investments will deliver savings that quickly pay off those investments.

12. *The Experience with Energy Efficiency Policies and Programmes in IEA Countries – Learning from the Critics*, IEA Information Paper, International Energy Agency, August 2005, p.3.
13. California Energy Commission (CEC) studies cited in *California: Low Carbon Leader, Business and Job Growth Opportunities,* The Climate Group, April 2006.
14. $MtCO_2$-e = megatonnes (million tonnes) carbon dioxide (CO_2) equivalent – with other greenhouse gases such as methane expressed in terms of carbon dioxide equivalence by applying a Global Warming Potential – for information on greenhouse gases and their GWP – see the Victorian Greenhouse Gas Inventory – 2004 Information Sheet at www.greenhouse.vic.gov.au.
15. Estimates based on existing measures, combined with the expanded program being implemented under the current 3-year work plan of the National Equipment Energy Efficiency Program, *When You Keep Measuring It, You Know Even More About It, Projected Impacts 2005 – 2020*, National Equipment Energy Efficiency Program, Report 2005/05, April 2005.
16. *Economic Impact Analysis of Improved Energy Efficiency, Phase 2 Report*, Allen Consulting Group, for SEAV, April 2002; *Energy Efficiency Improvement in the Commercial Sectors*, EMET Consultants for SEAV, February 2004; *Energy Efficiency Improvement Potential Case Studies – Industrial Sector*, Energetics for SEAV, March 2004.
17. *Towards a National Framework for Energy Efficiency – Issues and Challenges A Discussion Paper, NFEE*, November 2003, p.5.

Energy efficiency - a priority issue for the EU

Energy efficiency can make a very significant contribution to improving both environmental sustainability and competitiveness while alleviating pressures on the energy system. This is why energy efficiency is at the heart of energy and environment policies, both at Member State and EU level. … there is still a significant potential for improving energy efficiency. … a new sense of urgency is needed to fully tap the cost-effective energy efficiency potential.[22]

Examples of the scope for energy efficiency improvement in Victoria

- Up to around 11% of household electricity use could be cut by switching off stand-by power – at no cost[18] ; and if every Victorian household replaced just one conventional light globe with an energy efficient (compact fluorescent) globe, the savings would be 330,000 tonnes of CO_2-e per annum.
- If all Victorian households purchasing appliances this year bought models that were the highest available energy efficiency star rating rather than just the market average efficiency, this would generate greenhouse savings of around 150,000 tonnes CO_2-e per annum and savings on energy bills of $17.3M per annum.[19]
- Cutting edge projects in the commercial building sector are demonstrating that there are significant opportunities for energy efficiency improvements in new buildings and in retrofitting existing buildings – with landmark new and refurbished building projects estimated to achieve 71% and 48% less energy intensity, respectively, than standard office buildings.[20]
- Energy efficiency action plans being implemented by 500 Victorian industrial sites have identified estimated annual greenhouse gas emission reductions of 1.1 $MtCO_2$-e and energy cost savings amounting to $34M per annum, with actions averaging a payback period of just 17 months.[21]

In most cases improvements in energy efficiency can be achieved using readily available technologies – the question is the pace at which Victoria captures these greenhouse gas abatement and economic opportunities and the scale of their uptake.

While technology innovation and roll-out will continue to deliver incremental improvements over time, additional drivers for action have been identified to achieve significant change across government, business and households.

18. 2005 Intrusive Residential Standby Survey Report, Energy Efficient Strategies for the Equipment Energy Efficiency Committee, Report 2006/03, March 2006.
19. Estimation by Sustainability Victoria (SV) based on technical potential estimates for Energy Saving Campaign and using the average GHG coefficient for electricity.
20. By comparison with standard office buildings, Kangan Batman TAFE's new Docklands building is estimated to be 71% less energy intensive, and the refurbished Szencorp office building at 40 Albert Road, Melbourne will be 48% less energy intensive.
21. *The EPA Victoria Industry Greenhouse Program - The Story So Far*, EPA Victoria, February 2006 p.19.
22. *First Report of the High Level Group on Competitiveness, Energy and the Environment*, 2 June 2006, European Commission HLG on Competitiveness, Energy and the Environment.

Victorian Employers' Chamber of Commerce and Industry (VECCI) – on energy efficiency and greenhouse abatement

If the wider community values efforts to contribute to the greenhouse abatement task, demand management and energy efficiency measures potentially offer a low-cost method of constraining energy use (and resulting greenhouse emissions), without reducing economic growth. ... However, there are some important barriers to improving energy efficiency. These include a lack of information about potential energy savings and differential incentives ... Industry endorses increased funding of community and industry education programs in relation to improving energy efficiency.[23]

The importance of further action has been acknowledged by all State and Territory governments and the Commonwealth through a collaborative program of research, analysis and action under the National Framework for Energy Efficiency (NFEE) (refer Appendix 1). NFEE was established by all Australian governments in August 2004 as a vehicle for increasing the uptake of energy efficiency. This national process builds on an existing framework of joint action in key areas such as the National Equipment Energy Efficiency program which coordinates the implementation of mandatory energy labelling and Minimum Energy Performance Standards (MEPS) for appliances and equipment.

Victoria has played a major role in the NFEE process to date and is committed to its successful implementation and evolution. Victoria is also committed to providing leadership on energy efficiency – as demonstrated by the early adoption of 5 star energy efficiency standards for all new homes and the introduction of greenhouse and energy efficiency requirements for EPA licensees.

The co-benefits of energy efficiency

In addition to reducing greenhouse gas emissions, energy efficiency improvements deliver significant co-benefits, including:

- Social benefits through improved comfort levels at reduced costs. In a survey of 150 householders living in a 5 Star home[24], 89% said that their home is warmer in winter than their previous home and 76% said that they were using their heater less. In addition, 71% of the householders who had compared their energy bills said that their bills were lower. Surveys undertaken for the Energy Task Force indicate that 80% of householders receiving energy efficiency home retrofits believe that their home is now warmer in winter. Research has shown that there is a link between poorly heated housing and ill health.[25]
- Economic benefits from reduced costs to energy users, improved productivity and the related creation of employment through expansion of the energy services industry. In addition, as energy efficiency improvement is investigated in a particular product or process, other productivity improvement opportunities (capital, labour, design, different approaches to energy services) are revealed.
- Reduced energy supply costs through avoiding the need for additional power stations. For example, appliance policies in IEA member countries reduced greenhouse gas emissions by some 46Mt CO_2/year by 2000, avoiding the need for at least 25 gas-fired power stations. Even without further strengthening, these same policies will go on to reduce emissions by 146Mt CO_2/year by 2010.[26]

Analysis undertaken as part of the development of NFEE indicates that, in addition to reducing Victoria's greenhouse gas emissions, increased energy efficiency will also lead to net economic benefits. It was estimated that the introduction of cost-effective energy efficiency measures in the stationary energy sector which achieved an additional one per cent per annum energy saving over a 10-year period (including a ramp up and ramp down phase) could, in the tenth year:

- reduce greenhouse gas emissions by 6.2 Mt CO_2-e;
- increase real investment by $120M; and
- increase Victorian Gross State Product (GSP) by $360M.[27]

23. *The Victoria Summit – Taskforce Report Energy*, VECCI, 8 November 2005.
24. *The Experience of Living in a 5 Star Energy Rated Home*, prepared for Sustainability Victoria by Worthington Di Marzio Research, December 2005.
25. Children who grow up in homes which are cold, damp and expensive to heat are more likely to suffer from asthma, were more frequently absent from school and visit their GPs more often. University of Strathclyde/Energy Action Scotland, Department of Health, UK.
26. *Cool Appliances. Policy Strategies for Energy Efficient Homes: Energy Efficiency Policy Profiles*, International Energy Agency, 2003.
27. Economic modelling by the Allen Consulting Group for the National Framework for Energy Efficiency, April 2004.

Barriers to energy efficiency

Opportunities for further cost-effective improvements in energy efficiency exist. Part of the Government's role in developing policy is to identify the barriers to energy efficiency and the mechanisms to overcome them. As noted by the International Energy Agency:

Effective market forces and good information can accelerate energy efficiency improvements, but market failures and barriers can inhibit efficiency gains. In such cases, certain government interventions may be useful in focussing market interest on energy efficiency. These include codes, standards, voluntary agreements, special financing arrangements and clustering small projects into investment portfolios.[28]

The key barriers to energy efficiency are poor information, split incentives for tenants/landlords, behavioural and institutional inertia and the perceived risks of energy efficiency investment. Also, while there are some differences in the barriers for businesses and households, a common issue is that energy is generally not a high proportion of business or household expenditure and, therefore, energy efficiency is not a 'top-of-mind' issue for most households and businesses. As noted by the Productivity Commission, energy costs are low relative to other costs – representing about 2.5% of total expenditure in the residential sector, 1.6% of total expenditure in the commercial sector and less than 3% of total expenditure in many industrial sectors.[29] These and other barriers are outlined in Table 1 (next page).

28. http://www.iea.org/textbase/subjectqueries/keyresult.asp?KEYWORD_ID=4122.

29. *Energy Efficiency Productivity Commission Draft Report*, April 2005, p.98 and p.160.

Business	Households
Costs of searching for information and expertise to implement energy efficient solutions	Time constraints to search for information and identify tradespeople with expertise to implement energy efficiency measures
Inertia and lack of awareness/ technical expertise in trades and professions designing/installing and maintaining buildings and plant	Third parties such as builders, plumbers and electricians often make key decisions that affect energy efficiency, without consideration of the long term costs and environmental impacts
Perceived risk of investing in energy efficiency – uncertainty about the paybacks and operational outcomes	Lack of awareness of the link between energy use and its environmental impacts; and little appreciation of the potential for energy efficiency measures to reduce such impacts and energy bills
Energy is not seen as a 'core' business input and energy efficiency investments may therefore be required to meet higher hurdle rates or be overlooked in the event of internal capital constraints	Focus on up-front costs of buildings, appliances and equipment rather than the running costs – energy efficiency investments also compete with other demands on the household budget
Resistance to adopting new practices, other demands on the time of business or energy bills being paid by areas of a business that don't have the opportunity to control energy demand	Resistance to changing habits/behaviour and 'hassle factor' of taking action on energy efficiency
Complexity and limitations of markets – eg. pricing structures do not reflect the full costs imposed on the environment by energy production	
Inadequate information on the costs and benefits (including the greenhouse gas abatement benefits) of implementing energy efficient solutions – and on how to do this	
Split incentives – in particular, the landlord/tenant barrier – the person who builds or owns a property is not always responsible for paying the energy bills and, therefore, has limited incentive to make sure that the building fabric or the installed appliances/ equipment are energy efficient	
Availability of relatively new and emerging energy efficiency technologies and services in the marketplace	

> Table 1 - Barriers to the uptake of energy efficiency opportunities

strategic framework for energy efficiency

Victoria's energy efficiency objectives

Economy-wide improvements in energy efficiency are required to:

1) reduce Victoria's greenhouse gas emissions and help prepare the State for a carbon-constrained future;
2) enhance Victoria's energy supply security and reduce the need for increases in supply capacity; and
3) reduce total energy costs for Victorian households and businesses.

The task for Government

The Government's roles and responsibilities with respect to achieving energy efficiency improvements, the timeframe for action and its interactions with the community and other stakeholders, are broadly defined below.

Addressing barriers that inhibit the uptake of energy efficiency

Energy efficiency is complex – as a wide range of factors influence the uptake of energy efficiency (see Table 1). It requires changes in the behaviour of millions of consumers, and the engagement of thousands of tradespeople, builders, manufacturers and retailers to influence many different end-uses. Government action seeks to overcome the barriers that inhibit the uptake of cost-effective energy efficiency potential. This is best achieved through a mix of targeted policies and programs that stimulate demand in different sectors and overcome a range of barriers.

Taking early action on energy efficiency and committing to a sustained effort

We can act now to improve energy efficiency and make immediate gains in terms of greenhouse gas abatement.

In the short term – the next 5 years – the Government is looking to increase the take-up of low and no-cost opportunities for improved energy efficiency, including through behaviour change. This will provide an immediate and important contribution to reducing greenhouse gas emissions across the economy and to establishing the basis for an energy saving culture. Early action on energy efficiency is also important when planning investments in long-lived assets, such as buildings and industrial plant and equipment.

Experience shows that a sustained effort can improve energy efficiency, recognising that new opportunities will continue to emerge[30]; that it takes time for energy savings to accumulate; and that it is critical to update policies such as labelling schemes and efficiency regulations to ensure continual improvement in their effectiveness.[31] In particular, raising community awareness of the importance and value of energy efficiency will require a sustained long term effort.

30. Whilst some observers take the view that energy efficiency opportunities will diminish over time, since 1973, studies in a range of sectors and countries have indicated that, despite progress in implementing energy efficiency opportunities, the potential remains at similar levels. Ref; SEAV/Armstrong 2003.

31. *The Experience with Energy Efficiency Policies and Programmes in IEA Countries – Learning from the Critics*, IEA Information Paper, International Energy Agency, August 2005, p.21.

In the medium to longer term, further opportunities for energy efficiency improvements will arise as a result of new technologies, techniques, materials, process improvements and a better understanding of the role of energy efficiency. In addition, energy efficiency investments are likely to become more cost-effective over time as energy prices increase in response to a pricing signal for greenhouse emissions. Accordingly, the Government will continue to identify and pursue measures to realise opportunities for energy efficiency improvements.

Working collaboratively

The Government is working collaboratively at a national level and in partnership with local government, community organisations and other stakeholders. We recognise that some areas of energy efficiency policy are best progressed at a national level – in particular, actions such as energy standards for appliances require uniform national policy approaches. In other areas there are opportunities for collaborative research and analytical work. The National Framework for Energy Efficiency (NFEE) provides an important framework for progressing collaborative action.

Local government has an important role to play in providing 'grass roots leadership' and engaging communities and individuals in action on energy efficiency and greenhouse gas emission reduction. The Victorian Government is providing strong support for action by local government and will continue to pursue partnerships with local government and other community organisations. In particular, local government, industry stakeholders and community organisations are recognised as having an important contribution to make in the development and, in some cases, the delivery of Government policies and programs.

Accelerating the uptake of energy efficiency opportunities

The Government is extending and accelerating the uptake of energy efficiency opportunities through the following broad strategies.

- Informing and motivating consumers to change behaviour and make energy efficient choices
  - Campaign to raise awareness of the links between energy consumption and climate change and the potential for improving energy efficiency and realising energy cost savings.
- Reliable and accessible information for consumers at point of purchase, including energy labelling of appliances and equipment and information about energy ratings of homes.
- Partnerships with appliance, hardware and lighting retailers and other providers of energy consuming products who can assist in providing consumers with information/advice at the point of purchase.
- Improved information on consumer energy bills to promote understanding of how individual consumers are performing with regard to energy efficiency.
- Reporting outcomes of programs and benchmarking Victoria's energy consumption and energy efficiency against best practice.

The Government is working collaboratively at a national level and in partnership with local government, community organisations and other stakeholders.

- Driving investment in cost-effective energy efficiency and overcoming financial barriers
  - Requirements for cost-effective investment in energy efficiency action by large energy users.
  - Rebates and financial incentives for energy efficient products and services.
  - Trialling of energy performance contracting and support for other innovative financing options.
- Requiring minimum energy performance standards
  - Energy efficiency design standards for new homes and commercial buildings.
  - Minimum energy performance standards (MEPS) for key appliances and equipment.
- Facilitating industry development and capacity building to meet growing consumer demand
  - Training and accreditation programs to skill up tradespeople and the energy services industry.
  - Benchmarking the energy efficiency of key sectors to stimulate uptake of best practice.
- Encouraging innovation to design and implement energy efficiency improvements
  - Incentives for action beyond minimum energy performance standards, including support for demonstration projects.
  - Promotion of advanced energy efficiency practices and technologies.
  - Support for research, development, demonstration and commercialisation of energy efficiency technologies.
- Introducing appropriate market/pricing signals
  - Commitment to work with other States and Territories to develop a national emissions trading scheme.
  - Implement advanced metering and pursue energy pricing regimes that induce efficient resource use by businesses and households, including through improved pricing signals.
- Providing Government leadership
  - Demonstrating opportunities for cost-effective savings through action in the Government sector.
  - Requiring Government Departments to implement cost-effective energy efficiency opportunities.

victoria's action plan for energy efficiency improvement

Victoria has led the way in the introduction of energy efficiency measures in both the household and business sectors.
In particular, policies and programs undertaken to date have targeted critical investment points by businesses and households for example:

- at the design/building stage of new homes and commercial buildings – through minimum energy efficiency standards;
- investment in major new industrial developments or upgrades of industrial plant – through assessment of energy efficiency opportunities as part of the EPA Works Approvals processes; and
- purchases of appliances and equipment – through minimum energy performance standards and energy labelling and targeted incentives for high efficiency gas heating and hot water systems in rural, regional and outer suburban areas.

The Government will build on these achievements through a mix of policy tools and measures, including: information programs; financial incentives; industry development and capacity building; performance-based regulation; and Government leadership measures.

In the future, the Government is looking to the introduction of a national emissions trading scheme (ETS) as a key driver of greenhouse gas abatement, in combination with a range of other measures. It is anticipated that, under an ETS, energy efficiency will become an increasingly important priority for business and households as the price of energy starts to reflect its environmental impact. However, complementary measures will be necessary to reinforce and support an ETS.

Energy Efficiency and Emissions Trading

The *Greenhouse Challenge for Energy* position paper (December 2004) highlighted the Victorian Government's view that the most cost-effective approach to greenhouse gas emissions reduction in the energy sector involves a package of measures including emissions trading supported by measures to drive improvements in energy efficiency.

The Victorian Government is currently working with all States and Territories to design a national emissions trading scheme (ETS).

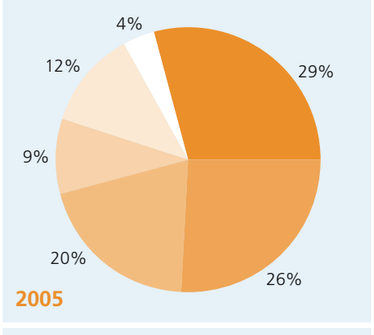
Government policies and programs to facilitate greater levels of energy efficiency will be a key complement to the national ETS in that they will:

- reduce the amount of emissions abatement that needs to be driven by emissions trading itself – thereby lowering the permit price expected under an ETS; and
- reduce the extent of exposure of businesses and households to higher energy prices resulting from an ETS by lowering energy use and, therefore, energy costs.

The policies and programs detailed in the following pages provide an important next step in the achievement of energy efficiency improvements, building on current programs and responding to new challenges and opportunities.

1 FOR HOUSEHOLDS

Just over one third of Victoria's energy is used in the home (see Figure 3), accounting for greenhouse gas emissions of 20.5 $MtCO_2$-e. Over the period 1990 to 2004, energy consumption in the residential sector increased, with energy-related greenhouse emissions growing by 32.6%.[32] The average Victorian household generates around 11.9 tCO_2-e each year as a result of energy use in the home.[33] The majority of greenhouse gas emissions in the residential sector come from heating, water heating and electrical appliances such as TVs and other home entertainment systems. Estimates of the contribution of activities within each household are presented in Figure 5.



> Figure 5 - Victorian residential end use greenhouse emissions, 2004-05 *(Sustainability Victoria)*

32. *Energy Working Party Conference*, National Institute for Economic and Industry Research, December 2005.
33. Sustainability Victoria analysis of published energy data from various sources.
34. *Comparative Cost Benefit Study of Energy Efficiency Measures for Class 1 Buildings and High Rise Apartments in Victoria*, prepared for the Sustainable Energy Authority of Victoria and the Building Commission (Victoria) by Energy Efficient Strategies, June 2002.
35. *When You Keep Measuring It, You Know Even More About It, Projected Impacts 2005 – 2020*, National Equipment Energy Efficiency Program, Report 2005/05, April 2005.

The main energy efficiency achievements to date have been:

- New homes in Victoria have to be built to a 5 star energy standard – requirements introduced in July 2004, are projected to generate Victoria-wide savings on household energy bills of $30 to $40M per annum after 5 years and reduce greenhouse gas emissions by 2 million tonnes over the first 10 years.[34]
- Minimum Energy Performance Standards (MEPS) and energy efficiency labelling schemes – 6 electrical appliances are required to have energy labels at point of sale and 11 categories of electrical appliances and equipment are now subject to MEPS. It is estimated that this program was delivering greenhouse gas abatement of 0.3 $MtCO_2$-e in Victoria in 2004, and is projected to deliver savings of 44.2 $MtCO_2$-e over the period 2005 to 2020.[35] Work has also commenced on a nationally consistent approach to regulating the energy efficiency of gas appliances.
- Upgrading the energy efficiency of Office of Housing and other low income homes to improve their energy efficiency, achieving improvements from around a 1.5 to 3 stars energy rating in some Office of Housing properties. The Energy Task Force program has undertaken approximately 3300 energy efficiency home retrofits and delivered energy savings of 15% (on average), equivalent to a saving of $106 annually per household.

The main challenges for households are to:

- Improve the energy efficiency of the existing housing stock – there are some 2.1 million homes throughout the State, these existing homes are likely to remain in use for the next 50-80 years – those built between 1994 and 2004 are estimated to have an energy rating of around 2 stars, and those built prior to 1994 an energy rating somewhat less than this.
- Adopt cost-effective energy-saving behaviour ('turning down' and 'turning off', using cold water to wash clothes etc.) and the purchase of energy efficient appliances.

To this end, the Government has launched a major **Energy Saving Campaign – "You have the Power – Save Energy"**. The Campaign is to drive behaviour change in the Victorian community by making individuals aware of the contribution they can make – a key message being that if every Victorian household took the simple steps suggested which would reduce their energy use by 15%, it would prevent almost 3 million tonnes of greenhouse gases from entering the atmosphere each year.

Underpinning the Energy Saving Campaign, is action to help householders make better, more energy efficient choices when investing in new homes and domestic appliances.

The average Victorian household produces around 240,000 balloons of greenhouse gas a year. Below are listed the top 10 things Victorian households can do to save money, energy and reduce greenhouse gas.

Top 10 Tips Checklist	Annual Savings (Balloons)
1. Install or top-up insulation in ceilings	Up to 25,000
2. Switch off the second fridge	Up to 20,000
3. Take shorter showers – keep them under 5 minutes instead of the 8 minute average	16,000
4. Switch appliances off at the powerpoint wherever possible	7,800
5. Set thermostat to 18-20°C in winter and 26°C in summer	7,200
6. Wash clothes in cold water	4,300
7. Close off areas that don't need heating in winter	2,500
8. Replace standard light globes with energy efficient globes in high use areas	1,000
9. Seal draughts and gaps around external doors and windows	800
10. Switch off lights when not needed	700

Note: 1 balloon = 50 grams of greenhouse gas
For further information about how you can save greenhouse gas emissions, energy and money **telephone 1300 363 744 or visit www.sustainability.vic.gov.au**

Policies and programs to improve household energy efficiency in Victoria are detailed in the following pages – new actions are highlighted in italics.

Improving the built environment

1.1 Energy efficiency requirements for new housing (5 Star Homes)

The 5 star standard for all new houses in Victoria came into effect from 1 July 2005. This makes it compulsory for new houses to have a 5 star energy rating for the building fabric and to install a rainwater tank or a solar hot water system.

As part of the Victorian Sustainable Buildings initiative announced in Our Environment, Our Future (2006) the Government will:

- ***Further develop the 5 star approach, undertaking analysis to establish sustainability performance standards for residential buildings, incorporating energy and water efficiency.*** *As part of this, the Government will: consider the current trade-off between saving energy or saving water; clarify requirements for the installation of solar hot water systems; and examine the case for consideration of other installed fixtures as part of sustainability performance assessments, and for new homes and major renovations (inclusive of plumbing) to install a gas-boosted solar hot water system.*
- ***Implement a flexible tool to assess the sustainability performance of residential buildings for application both through the building system – as a basis for meeting new sustainability performance standards – and in the planning system – to meet sustainability design elements.***

During the development of this tool, the Government will consider the inclusion of sustainability issues such as stormwater and materials use, in addition to energy and water use in buildings.

- ***Conduct a pilot program to provide consumers with information about the environmental performance of residential buildings at point of sale, lease or rental,*** *as agreed through the National Framework for Energy Efficiency. This will commence with the introduction of a national process for disclosure of house energy ratings.*

Responsible Department/Agency

Department of Sustainability and Environment, Building Commission & Sustainability Victoria

1.2 Energy Task Force

The Government will continue this program which is assisting pensioners and low-income Victorians to retrofit their homes through insulation and draught stopping to reduce their energy costs and improve the comfort and quality of their homes. This program will continue to provide job training and employment opportunities for unemployed Victorians.

Funding

$600,000 in 2006/07

Responsible Department/Agency

Sustainability Victoria

Information and behaviour change

1.3 Energy Efficiency and Sustainability Campaign

In June this year, the Government launched the first phase of a major, long-term campaign, using print and television advertising, to raise community awareness of the importance of saving energy to reduce greenhouse gas emissions.
Over the next two years we will expand the campaign which will be underpinned by a range of measures – including more information to help Victorians make the right choices.

Funding

$7.4M over 2 years

Responsible Department/Agency

Department of Sustainability and Environment, Department of Infrastructure & Sustainability Victoria

1.4 Greener appliances: maximising energy and greenhouse savings from key appliances and equipment through MEPS

Mandatory minimum energy performance standards (MEPS) for key domestic appliances and commercial/industrial equipment are a highly effective means of achieving greenhouse gas abatement. The Government is committed to accelerating the development and roll-out of MEPS.

We will work through national processes to expand and enhance the coverage of MEPS, including MEPS for television and home entertainment equipment, computers, chillers, heating and cooling, lighting; and to introduce a fully national scheme for regulating the energy efficiency of gas appliances and equipment.

Responsible Department/Agency

Sustainability Victoria

1.5 Better billing: benchmarking information for household energy bills

Energy bills can provide information to help Victorians save energy. As part of the National Framework for Energy Efficiency process, the Government will work with energy retailers to make energy bills more informative. This will enable households to better monitor their energy use over time, and compare their consumption with other similar households.

In addition, through the Ministerial Council on Energy, further work is being undertaken to establish minimum disclosure standards for retailers which will assist households to compare energy offers and understand the differences and rationale behind different energy pricing structures.

Responsible Department/Agency

Sustainability Victoria, Consumer Affairs Victoria, Department of Infrastructure

As part of the National Framework for Energy Efficiency process, the Government will work with energy retailers to make energy bills more informative.

Rebates and incentives

1.6 Rebate for high efficiency gas heaters/water heaters

The High Efficiency Gas Heater Rebate Program (HEGHR) is assisting Victorians in rural, regional and outer suburban areas to choose a more sustainable and affordable form of space heating by encouraging a switch to high efficiency gas heating appliances. High efficiency gas space heating appliances are those appliances which have a minimum star rating of 4-5 stars. The existing program – which is valued at $2.5M and commenced in April 2004 – was due to conclude on 30 June 2006. However, it is now being extended for a further year at which stage it will be reviewed to assess its effectiveness.

Funding

$1M over 2006/07

Responsible Department/Agency

Department of Infrastructure, Sustainability Victoria

1.7 Rebates for being green: supporting smart energy choices

The Government will support pilot rebates and incentives programs targeting areas of household energy use, which could include:

- *replacing and/or removing old, inefficient refrigerators (including extra fridges kept in the garage);*
- *encouraging consumers to choose the highest star rated model when purchasing new appliances;*
- *upgrading old gas ducted heating systems; and*
- *installing insulation and draught-proofing.*

Funding

$1.5M over 3 years

Responsible Department/Agency

Sustainability Victoria

1.8 Right advice at the right place: partnerships with appliance, hardware and lighting stores

The Government will seek to ensure that all Victorians have access to energy-saving information at the time and place of purchase of appliances and equipment. These activities will significantly leverage the impact of the Energy Efficiency and Sustainability Campaign (see Action 1.3).

Funding

$2M over 2 years

Responsible Department/Agency

Sustainability Victoria

Communities Working Together To Save Energy

1.9 Greenhome Program

The Government is committed to rolling out the Greenhome program across Victoria. This program helps residents make eco-friendly lifestyle choices covering energy, waste, packaging, transport, gardens and water.

Funding

$4.2M over 4 years

Responsible Department/Agency

Department of Sustainability and Environment

1.10 Household Behavioural Change Regional Pilot

The Government is working in partnership with the Central Victorian Greenhouse Alliance (CVGA) to conduct a household energy efficiency behaviour change pilot program within the regional Victorian city of Castlemaine.

The pilot program represents a significant extension of previous small-scale projects with individual households and neighbourhoods – with 500 households to be directly involved. We expect this will lead to broader engagement of the majority of residents through community networking. The program has the capacity to reduce energy use and greenhouse gas emissions within households by between 15 to 30 per cent. The outcomes in terms of actual reductions achieved and the level of community engagement will provide a valuable input to further action on household behaviour change.

Funding

$500,000 over 2006-07

Responsible Department/Agency

Department of Sustainability and Environment in partnership with the Central Victorian Greenhouse Alliance (CVGA)

1.11 Green communities: Smart Energy Zones

New approaches to generating, distributing and using energy must be developed. The Government will pilot some of these new approaches through 'Smart Energy Zones', demonstrating how Victorian communities can dramatically and cost-effectively reduce their energy use and greenhouse gas emissions.

The initiative will build upon the projects being developed under the Solar Cities program and will also stimulate further innovative community-based projects across Victoria. These projects will demonstrate how community education on energy saving measures, energy efficiency, innovative electricity metering and tariffs and small-scale distributed generation can be combined to create 'Smart Energy Zones'.

Funding

$4M over 4 years

Responsible Department/Agency

Sustainability Victoria

Pilot projects will demonstrate how community education on energy saving measures, energy efficiency, innovative electricity metering and tariffs and small-scale distributed generation can be combined to create 'Smart Energy Zones'.

The Government will pursue energy pricing regimes that induce efficient resource use by businesses and households, including through improved pricing signals.

Providing clear signals to encourage energy conservation

1.12 Smart metering

The Government will accelerate the introduction of new electricity metering technology (that measures the amount and time of use of electricity by individual consumers) and ensure that these meters incorporate advanced communications technology that provides consumers with immediate feedback on their electricity use and so encourages them to moderate their energy demand. This will facilitate the introduction of new price structures that encourage energy conservation.

The Government will undertake trials to test interval metering technology and will work with retailers to conduct pricing trials as part of the rollout of interval meters. The pricing trials will help to inform Government of customer response to pricing structures and in-house displays.

Funding

$2M over 4 years for interval metering trial

Responsible Department/Agency

Department of Infrastructure, Essential Services Commission

1.13 Smarter energy pricing

Victoria's Environmental Sustainability Framework, released in 2005, committed the Government to achieving pricing regimes that induce efficient resource use by businesses and households. Appropriate energy pricing has the potential to complement other initiatives aimed at improving energy efficiency.

The Government will pursue energy pricing regimes that induce efficient resource use by businesses and households, including through improved pricing signals, and will examine options in consultation with energy retailers and consumer groups.

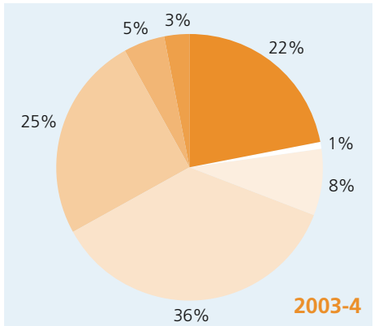
Responsible Department/Agency

Department of Infrastructure to lead whole of Government process

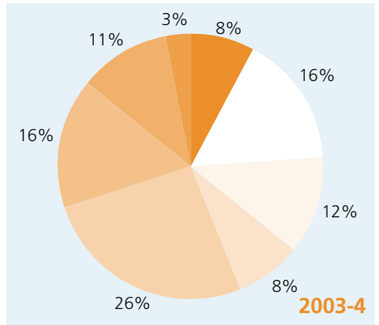
2 FOR BUSINESS

In 2003-4, businesses[36] were responsible for 54.77 $MtCO_2$-e of greenhouse gas emissions, accounting for 64% of Victoria's emissions from the stationary (non-transport) energy sector. The industrial sector was the main source (48%) of energy-related emissions with the key sub-sectors such as minerals processing (electrolytic processes), and end uses such as electric drives and process heat, being the main contributors.

The commercial sector was responsible for 16% of Victoria's energy-related greenhouse gas emissions mainly arising from electricity use for lighting, space cooling and ventilation. The commercial sector is experiencing strong growth in energy demand and greenhouse gas emissions with a 72.3% increase in energy-related emissions between 1990 and 2004.[37]



> Figure 6 - Industrial energy services sector greenhouse gas emissions 2003-04 (*DSE, 2005*)



> Figure 7 - Commercial sector greenhouse gas emissions 2003-04 (*DSE, 2005*)

The main energy efficiency achievements to date have been:

- Greenhouse gas and energy efficiency requirements introduced by the Environment Protection Authority which require energy savings plans to be prepared by over 500 industrial sites – this action is expected to deliver annual greenhouse gas emission reductions of 1.1 $MtCO_2$-e per annum, with estimated annual energy cost savings to these businesses of $34M.
- New commercial buildings (classes 5-9) and those undergoing major refits must be built to the new minimum energy efficiency standards (equivalent to a 4 star Australian Building Greenhouse Rating – ABGR) introduced from 1 May 2006. On a national basis, these changes are estimated to yield net benefits of $2.6 billion nationally over 10 years, with annual greenhouse savings of around 3.2Mt CO_2-e by the end of the 10 year period.[38]

36. This includes the following activities: heavy industry & manufacturing, mining and minerals processing, rural/ agricultural industries, and commercial/service/retail sector.

37. *Energy Working Party Conference*, National Institute for Economic and Industry Research, December 2005.

38. *Proposal to amend Building Code of Australia to include energy efficiency requirements for class 5-9 buildings, Regulatory Impacts Statement*, Australian Building Codes Board, 2006, p.iii.

The main challenges for businesses are:

- to improve operational energy efficiency in all commercial settings (offices, retail outlets, hospitals, accommodation etc), through behaviour change and equipment and lighting upgrades – noting that this sector is the fastest growing area of energy consumption; and
- to achieve wider uptake of the significant energy efficiency gains that have been demonstrated in both the commercial and industrial sector (see Box).

Demonstrating the potential for energy efficiency

The Government's Business Energy Innovation Initiative has supported innovative energy efficiency projects with leading edge businesses that have achieved major savings, including:

- DMG Industries Pty Ltd, a supplier of plastic injection mouldings, installed production process control equipment designed to significantly reduce electricity use through production line heating and cooling, switching off motors that are not in use and reducing peak load. Once completed, the project is expected to deliver savings in electricity of around 9% and greenhouse gas emissions savings of 1350 tonnes $C0_2$-e per annum.
- Frigrite Refrigeration Pty Ltd. is working with a major Australian supermarket chain to supply CO_2 cascade technology into supermarket refrigeration cabinets to greatly reduce greenhouse gas emissions. For a single supermarket, the refrigeration plant will deliver annual energy savings of $20,000 and reduced greenhouse gas emissions of 278 tonnes CO_2-e. For Victoria, based on 12 new stores and 22 refurbishments per year, there is projected to be additional annual greenhouse gas savings of 10,000 tonnes CO_2-e.

The Government's own energy efficiency program has demonstrated that significant savings can be made within most office settings. Actions implemented across Government offices, including energy efficient lighting and controls, timers and controls for heating, cooling and appliances, and behaviour change programs, have resulted in typical energy savings of 10-20%.

The Government has invested over $3M in energy efficiency measures in our public hospitals including energy efficient lighting and controls, automated building management systems and upgrades and timers and controls for heating and cooling and achieved savings of 1.5% of hospital energy use. Significant additional savings have been achieved through the use of cogeneration and the upgrade of hospital boilers.

Policies and programs to improve business energy efficiency in Victoria are detailed in the following pages – new actions are highlighted in italics.

Promoting business leadership and best practice

2.1 Energy Smart Business

Energy Efficiency Best Practice Demonstration projects will be pursued with key businesses in the manufacturing, commercial and retail sectors that are planning new facilities or major upgrades to existing facilities. The demonstration projects will support the identification, evaluation and investment in leading-edge energy efficient solutions, including: technologies, systems, processes and business practices.

These projects will help inform the development of energy efficiency benchmarks (see below) and will apply communication and replication strategies to drive uptake of best practice more broadly across Victoria.

In parallel, the Government will undertake a project to Benchmark Victoria's Energy Efficiency Against Best Practice. This project will provide meaningful measures of our progress with respect to energy efficiency, by benchmarking energy efficiency performance in key sectors or sub-sectors against best practice. The project will focus on the business sector, and will be progressed in partnership with appropriate stakeholder groups including industry associations.

The project will assist in driving uptake of best practice, informing and better targeting of government policy development and providing feedback and progress reports to key activity sectors and the community at large.

Funding

$5M over 4 years

Responsible Department/Agency

Sustainability Victoria

2.2 Small Business Energy Efficiency Regional Pilot Program

This project is exploring new approaches for the delivery of energy efficiency improvements in small to medium enterprises by making it a part of business operations and decision-making. It is a partnership with energy service providers, local government and small businesses and focuses on engaging a critical mass of participants from one community.

The pilot is being run in Port Fairy, managed through a partnership between ICLEI (the International Council for Local Environmental Initiatives), Moyne Shire and the South West Sustainability Partnership. A key element of the pilot project is the application of energy performance contracting for delivery and funding of energy audits and retrofits for small businesses.

Funding

$250,000 over 2006-07

Responsible Department/Agency

Department of Sustainability and Environment

A healthy and competitive energy efficiency services sector is an essential prerequisite for an efficient, low-emissions economy.

2.3 Enhanced sustainability in new investment

The successful greenhouse-specific investment facilitation pilot program provided incentive funding to encourage companies commencing a new investment or upgrading their operations to implement best practice energy and/or greenhouse technologies, rather than undertaking the "minimum required" to operate or comply with legislation. **This will be extended and expanded to encompass projects that deliver enhanced sustainability outcomes – including water and waste as well as energy efficiency.**

A wide variety of projects have been funded under the pilot, including lighting and utilities management; waste heat recovery; radiant heating and solar power generation. These have resulted in a total estimated reduction in greenhouse gas emissions of around 7,000 tCO_2-e per year. Total annual cost savings of nearly $430,000 will also be delivered to participating businesses.

Funding

$3.5M over 3 years

Responsible Department/Agency

Department of Innovation, Industry and Regional Development

'Building in' energy efficiency

2.4 Green offices

Minimum energy efficiency requirements for new and refurbished commercial and public buildings (classes 5-9, including office, retail, warehouses and health care facilities) were introduced in May 2006 under the Building Code of Australia. For a typical office building, this will deliver an estimated 45% improvement in energy consumption compared with the average Victorian office building.

The Government will also ensure new office buildings in Victoria meet a four star environmental rating (for buildings more than 5,000 square metres). This will drive action on water and waste and will strengthen performance on energy efficiency.

Responsible Department/Agency

Building Commission, Department of Sustainability and Environment

Growing the energy efficiency industry

2.5 Growing the energy efficiency industry

It is estimated that almost 5,000 Victorians are employed in jobs related to energy efficiency. A healthy and competitive energy efficiency services sector is essential for an efficient low-emissions economy. We need to have the skills, technologies, advice and services to support more business sectors and households to be more efficient.

The Government will develop a suite of policies that will help Victoria attract jobs in energy efficiency.

This will also provide an opportunity to address issues and recommendations raised in the June 2006 Inquiry into the Energy Services Industry by the Environment and Natural Resources Committee of the Victorian Parliament.

Responsible Department/Agency

Department of Sustainability and Environment, Department of Infrastructure, Sustainability Victoria

2.6 Training for tradies

The Government will provide training and accreditation for trades and professions on energy efficiency. This project will build on the work being undertaken through the National Framework for Energy Efficiency to develop the capacity of trades and professions to identify opportunities and implement energy efficient solutions, and deliver key on-ground programs working with electricians, residential heating and air conditioning installers and home sustainability assessors.

This will provide an extension of Victorian programs already undertaken which have trained over 850 plumbers with respect to the installation of solar hot water systems and accredited some 1000 house energy raters in sustainable practices.

Funding

Up to $1M

Responsible Department/Agency

Sustainability Victoria

As part of the Our Environment, Our Future Victorian Sustainable Buildings initiative, the Government will introduce requirements for all new office buildings in Victoria to meet a four star environmental rating.

Innovative environmental regulation

2.7 Help for large resource users

The Industry Greenhouse Program for existing and new EPA licence holders and works approval applicants aims to improve energy efficiency and reduce associated greenhouse gas emissions, as well as to improve the management of greenhouse gases not associated with energy usage. It does this by requiring licensees to conduct an energy audit and to implement actions with a 3 year or better payback. **An Energy and Greenhouse Management Toolkit** has been developed for Victorian businesses to assist in complying with licence and works approval requirements and to support ongoing energy efficiency.

Energy savings plans prepared by over 500 industrial sites are expected to deliver annual greenhouse gas emission reductions of 1.1 $MtCO_2$-e per annum, with estimated annual energy cost savings to these businesses of $34M. The energy efficiency actions undertaken at these sites have an average payback period of just 17 months.

Building on the achievements of this program, the Government is introducing Environment and Resource Efficiency Plans (EREPs) for the State's 250 biggest energy and water users. These companies must prepare and implement EREPs that include energy, water and waste reduction actions with a three-year or better payback period.

In addition, there will be a voluntary program for up to 1000 other large users through industry associations and targeted programs for key areas such as smaller commercial and industry resource users.

The EREPs program will also be complemented by the development of approaches suited to other target audiences (eg. smaller commercial and industry energy consumers, electricity generators) to deliver further outcomes following the success of the existing Industry Greenhouse Program.

Responsible Department/Agency

EPA

The Government has an important role in leading by example both by implementing measures to improve its own energy efficiency as well as developing robust monitoring and reporting arrangements.

3 GOVERNMENT LEADING BY EXAMPLE

The Government is leading by example by being more energy efficient and developing robust monitoring and reporting arrangements.

Since 2002, the Government has taken significant steps to improve energy efficiency and reduce its own greenhouse gas emissions. However, there are significant opportunities for further improvements. We will continue to demonstrate leadership across all areas of government.

The main achievement to date has been a 15% improvement in energy efficiency on average across Government (including all Departmental activity), with estimated annual savings in greenhouse gas emissions of around 225,000 tCO_2-e from implementing projects which have averaged a 2 to 5 year payback. In addition, Government Departments are meeting at least 10% of their electricity needs with Green Power (renewable electricity).

The main challenges are:

- ensuring that all new Government buildings achieve high standards of energy efficiency and other sustainability performance;
- upgrading the energy efficiency of major long-lived Government infrastructure, such as hospitals and schools, which are significant energy consumers – in 2003-04 health care facilities were responsible for 47% of Government energy consumption and educational facilities for 39%; and
- implementing innovative financing options, such as energy performance contracting, within Government as a means of addressing financial barriers to investment in energy efficiency and providing leadership to the private sector.

Policies and programs to improve energy efficiency in Government operations are detailed below – new actions are highlighted in italics.

State Government leadership

3.1 Government greenhouse gas emission reduction program

All Departments will be required to implement all cost-effective energy efficiency opportunities identified with a payback period of four years or less.

Performance with regard to energy and other sustainability measures will be reported on as part of Departmental Environmental Management Systems.

In addition, the Government sector will continue: to purchase greenhouse gas emission offsets to the value of up to $500,000 a year purchased by the Department of Sustainability and Environment on behalf of all Departments and agencies to reduce the environmental impacts of government vehicle fleets; and maintaining purchase of 10% of its electricity requirements from Green Power.

Responsible Department/Agency

Sustainability Victoria & Department of Sustainability and Environment

3.2 Greening our hospitals

A revolving fund will provide no interest loans to public hospitals and health care facilities for investments in energy efficiency retrofits and recommissioning works in public hospitals. The initial round of funding will enable up to 30 hospitals to upgrade their facilities, with further investments being funded in due course through this revolving fund. These projects are expected to achieve 10-25% reductions in greenhouse gas emissions and around a 20% reduction in annual energy costs with a payback period of 3-5 years.

From 2007, the Green Building Council's Green Star Tool for Health Care Facilities will be a key tool for use in the planning, design and construction process for Victorian public hospitals, clinics and health care facilities.

Funding

$3.3M

Responsible Department/Agency

Department of Human Services

3.3 Sustainable Schools

The Sustainable Schools program provides a holistic environmental sustainability program for schools, including programs focussing on energy efficiency.
The Sustainable Schools Initiative will extend the methods used in programs like Waste Wise Schools into the areas of biodiversity, energy use and water use.

Funding

$500,000

Responsible Department/Agency

Department of Education & Training

3.4 Greening our schools

$1M has been provided for the Department of Education for a 'Quick Wins' program to reduce energy use in schools, TAFE Institutes and Department of Education & Training offices through technology upgrades, education and behaviour change, and improvements to construction, operation and maintenance guidelines.

The Green Building Council of Australia is developing a Green Star rating tool for educational facilities which is expected to be launched in late 2006. The Government is intending to set minimum Green Star ratings for new Government school facilities, following the development of Green Star. It is intended that new environmental sustainability guidelines for the Building Quality Standards Handbook will be an immediate step for Green Star compliance. The $600M being invested in Building Tomorrow's Schools Today will also assist schools to make the quantum leap to becoming more sustainable and energy efficient.

Responsible Department/Agency

Department of Education & Training

3.5 Energy efficiency in major projects

From 2007, all Victorian Major Projects will be built using the Green Building Councils Green Star Tool for Public Buildings. A minimum star rating will be set on a project by project basis to ensure flexibility. This approach has already proved to be successful with the Melbourne Convention Centre project where the Government set a minimum rating of four stars and as a result of market leadership, will deliver a six star outcome.

Responsible Department/Agency

Department of Infrastructure – Major Projects

3.6 Sustainable procurement

The Government has significant purchasing power which can achieve better value, stimulate innovation, help to prove technologies and improve best practice and increase market demand for environmentally preferable goods and services.

The following measures will provide market signals to a wide range of suppliers and promote redesign and innovation:

- implement innovative financial solutions to facilitate energy efficiency within Government, including energy performance contracting;
- ensure green standards (including for energy efficiency) are included in all new Government leases; and
- establish minimum energy and water efficiency standards for major equipment and appliances (eg. white goods).

Responsible Department/Agency

Department of Treasury and Finance – Victorian Government Purchasing Board, Department of Sustainability and Environment, Department of Infrastructure

Working with Local Government

3.7 Cities for Climate Protection

The Cities for Climate Protection (CCP) Program provides a framework for local governments to take action to reduce emissions in their own operations and to work with their communities on greenhouse gas abatement, with energy efficiency being a key element of CCP action plans.

The Victorian Government has strongly supported local government involvement in the CCP program and Victoria is now leading the way – nationally and internationally – in action at this level.

Sixty-one Victorian Councils are CCP members – with over 90% of Victorians living in these local government areas. This approach provides a strong base for community engagement on energy efficiency and greenhouse action.

The Victorian Government is committed to supporting the ongoing participation of Victorian councils in this program.

Funding

$400,000 for 2006/07

Responsible Department/Agency

Department of Sustainability and Environment in partnership with the International Council for Local Environmental Initiatives (ICLEI)

3.8 It's easy being green

Local government is playing a leading role in growing markets for sustainable products through the ECO-Buy program, a Victorian-based local government green purchasing program, developed as a joint initiative between the Municipal Association of Victoria (MAV) and the Victorian Government.

The ECO-Buy program has been successful in increasing procurement of recycled, greenhouse-friendly and environmentally preferred products, including energy efficient appliances and equipment, within the local government sector. ECO-Buy currently has a membership of 59 councils (75% of all Victorian councils). ECO-Buy has helped grow green purchasing in local government from $5.9M in 2001 to $81.9M in 2005, including around $7M on energy efficient appliances and equipment.

In addition to continuing its support for local government action, the Government will support a major expansion of the ECO-buy program to drive green procurement in other sectors.

Funding

$300,000 in 2006/07 to support local government/ business action

$1.5M over 4 years for expansion of ECO-Buy

Responsible Department/Agency

Department of Sustainability and Environment

4 MONITORING AND REPORTING ON PROGRESS WITH ENERGY EFFICIENCY

To make sure we are making energy efficiency savings that have been identified, we need robust measures to track our performance. In particular, we need to improve our understanding of energy consumption trends and our capacity to measure energy efficiency improvements and rigorously assess the performance of policies and programs.

Assessing energy efficiency is a complex task and has been constrained in the past by the lack of good quality data[39] and inconsistent and uncoordinated approaches to measurement and evaluation. In addition, as noted by the International Energy Agency, "measuring energy savings from energy efficiency policies or programmes differs from measuring energy supply from a power plant, oil refinery, or gas pipeline. In most cases, it is not possible to directly measure energy savings." [40]

The Government is working to improve the quality, timeliness and accessibility of information on Victoria's energy use, evaluate the effectiveness of its policies and strengthen data sources. Through the National Framework for Energy Efficiency (NFEE) the Government is supporting the development of a data collection, reporting and evaluation framework for energy efficiency programs. It is intended to use this for Victorian energy efficiency programs in addition to the nationally coordinated programs being implemented under NFEE. These initiatives will help inform Government decision-making and provide a basis for meaningful reports to the community on progress.

The Government is working to improve the quality, timeliness and accessibility of information on Victoria's energy use and to evaluate the effectiveness of its policies.

39. Energy consumption data collection and reporting is limited in Victoria. No single source provides the data required and there is no regular state-wide reporting regime – to analyse trends a number of sources have to be drawn upon.

40. *The Experience with Energy Efficiency Policies and Programmes in IEA Countries – Learning from the Critics*, IEA Information Paper, International Energy Agency, August 2005, p.28.

Programs to strengthen energy data and the monitoring and reporting of progress with respect to energy efficiency are detailed below – new actions are highlighted in italics.

Tracking our progress with energy efficiency

4.1 Collecting and reporting energy consumption data

To better inform the Government's energy and greenhouse policy decisions and assist in the evaluation of programs, we will source aggregate energy data across a number of similar households in terms of age, demographics and type of housing. The data will initially be collected from a number of locations across Victoria to represent a broad cross-section of different household types.

The Government will investigate what additional data is needed to inform programs to reduce energy consumption and provide regular reports to the Victorian community on energy consumption.

Specifically, the Government will;

- *develop energy end-use and resultant greenhouse gas emissions projections for the Victorian commercial, residential and industrial sectors;*
- *work with energy distribution businesses to obtain recorded energy end-use data by sector and location;*
- *collect specific data on Victorian residential buildings and fixed appliance stock e.g. insulation, hot water systems; and*
- *regularly survey household energy consumption – incorporating both behaviour and housing energy performance.*

Responsible Department/Agency

Department of Infrastructure, Department of Sustainability and Environment, Sustainability Victoria

4.2 Energy Efficiency Improvement Indicators

The ability to measure improvements to energy efficiency and assess which levers have led to these changes is fundamental to developing a detailed understanding of how policies are working, and which are the most effective measures for driving change.

The development of energy efficiency improvement indicators will enable the Victorian Government to assess efficiency improvements in the economy as a whole, and in specific sectors where it is planned to introduce benchmarking against best practice.

The indicators will be developed on the basis of available data – for example, monitoring the market penetration of more energy efficient technologies and processes.

This project will be progressed in partnership with appropriate stakeholder groups including industry associations.

Responsible Department/Agency

Department of Sustainability and Environment

5 FUTURE DIRECTIONS

The Government wants Victoria to be a leader on energy efficiency within Australia and this Action Plan provides the next steps to achieve this.

Energy efficiency can significantly reduce greenhouse gas emissions and improve economic and social performance in the next 5 to 10 years and also make a major contribution in the medium and longer term (10 to 50 years).

However, as demonstrated by measures taken to date, there is no single or simple 'quick fix' that will deliver energy efficiency. The key is a sustained effort and flexibility to respond to new opportunities. That's why the Victorian Government is working in partnership with other key stakeholders, to capitalise on opportunities to improve and change behaviour.

Rigorous and independent evaluation of existing policies and appraisal of policy options will be vital. Evaluation allows us to assess whether our policies are delivering their intended outcomes, including greenhouse gas emission reductions. Appraisal enables us to assess and compare different policy options for their effectiveness in delivering desired economic, social and environmental outcomes.

To this end, the Government will:

- report regularly on progress with implementation of this Action Plan, consistent with commitments to reporting in *Our Environment, Our Future* (2006);
- evaluate energy efficiency policy and program outcomes, drawing on the framework to be developed through the NFEE process;
- undertake an ongoing review of emerging energy efficiency opportunities and appraisal of policy options, including through the NFEE process; and
- provide further updates, as appropriate, on policies and programs to drive uptake of energy efficiency.

The key to achieving energy efficiency improvements is a sustained effort capable of responding to emerging opportunities for further improvement.

appendix 1. national framework for energy efficiency

The National Framework for Energy Efficiency (NFEE) was established by all Australian governments in 2004 in order to achieve significant economic and environmental benefits, and reduced energy demand, through a major enhancement of Australia's energy efficiency performance across all sectors of the economy. Stage One NFEE, which focuses on foundation measures, is being implemented over a three-year period from August 2004. It consists of seven policy packages covering the residential, commercial, industrial and government sectors. A reporting and evaluation framework will be developed to ensure a nationally consistent approach to assessing the impact of the programs implemented under these packages. The framework approach of NFEE encourages cooperation and coordination between jurisdictions in developing and implementing energy efficiency policies and programs, without compromising jurisdictional flexibility to introduce State-based innovative initiatives.

Equipment Energy Efficiency

Aims to improve the energy efficiency of key appliances and equipment by increasing the number of products that are subjected to mandatory minimum energy performance standards (MEPS) and/or mandatory energy labelling, and expanding the existing electrical scheme to cover gas products. Since August 2004, the number of electrical products subjected to MEPS has increased from five to eleven, with three of these progressing to more stringent MEPS levels. A national committee has been formed to implement nationally coordinated energy efficiency regulation for gas products, with domestic gas water heaters and gas heaters the first targets for action.

Building Energy Efficiency

Aims to drive improvements to the energy efficiency of both new and existing residential and commercial buildings, through a combination of minimum standards and disclosure of building energy performance. Minimum energy performance standards for all residential and commercial buildings were adopted nationally through the Australian Building Codes Board from May 2006. Work is now being undertaken on the development of mandatory disclosure of the energy performance of residential and commercial buildings at time of sale or lease.

Commercial & Industrial Energy Efficiency

Aims to motivate action by senior management of large businesses to identify and implement energy saving opportunities, as well as building industry capacity to deliver energy efficient solutions through a range of capacity building programs. The Commonwealth Government's Energy Efficiency Opportunity program targeting large energy users has been agreed for implementation from July 2006. Work is now progressing on nationally coordinated approaches to demonstrate innovative energy efficient solutions, develop energy efficiency best practice networks and increase the availability of information for business.

Government Energy Efficiency

Aims to demonstrate leadership to the business sector and wider community by developing a nationally consistent approach to annual reporting by governments on energy use and savings, establishing minimum energy performance standards for government buildings, and developing best practice models for government departments to implement energy efficiency programs.

Trade and professional training & accreditation

Aims to develop the capacity of relevant professions and trades to identify opportunities and implement energy efficient solutions. Based on an initial scoping study, work is now progressing on developing training programs for electricians, heating, ventilation and air-conditioning (HVAC) designers and installers, engineers and facility managers.

General consumer awareness

Aims to raise the awareness of general consumers (householders and small business) and motivate energy saving action. The initial focus of this program has been on identifying opportunities for governments to coordinate information programs, and on developing benchmarking for energy bills to motivate consumers with above average energy usage to seek energy saving advice.

Finance sector awareness

Under this package government agencies will increase the finance sector's awareness of the benefits of energy efficiency and work with the finance sector to stimulate the development and availability of innovative finance products for energy efficiency.

Information on the National Framework for Energy Efficiency is available at http://www.nfee.gov.au